REMARKS

Status of the Claims

Claims 1, 4, 9, and 18 have been amended to state that Mg, N, and Mn are jointly incorporated such that the crystal phase stability of the Ni fcc lattice is improved. Support for this amendment can be found, for example, on page 20, lines 3-5 of the application as filed. Claims 2, 6, 7, 12, 14-16, 21, 23-25 have been amended to call for both Fe and Si, as opposed to the presence of at least one of Fe and Si. Support for this amendment can be found, for example, in the claims as originally filed. No new matter has been added by these amendments.

Claims 1-26 remain pending and at issue.

Features of the Present Application

The present application relates to a Ni-based alloy with excellent corrosion resistance or stress corrosion resistance to supercritical water containing inorganic acid generated by the decomposition and oxidization of the organic toxic materials used in chemical weapons or industrial waste. A feature of the Ni-based alloy of the present invention is that Mg, N and Mn are jointly incorporated to stabilize the crystal phase (fcc matrix) of the presently claimed nickel-based alloys. The Ni-Cr-Mo, Ni-Cr-Ta, and Ni-Cr-W systems do not precipitate out in a second phase, and remain stronger over time, due to the joint incorporation of Mg, N and Mn therein. The high chromium containing nickel alloys of the present application -- which do not normally have phase stability -- are thus stabilized by the simultaneous addition of N, Mg, and Mn providing for long-term stability relative to their supercritical water environment.

Rejections Under 35 U.S.C. § 103(a)

Claims 1-3 stand rejected as obvious over JP 9-256087 (JP '087). JP '087 discloses a Ni-Cr-Mo alloy which purportedly has an excellent high temperature grain boundary corrosion resistance. The alloy contains Si, P, Zr, Hf, Mn and Mg in order to provide grain boundry corrosion resistance to the nickel base alloy. This nickel based alloy of JP '087 is used as heat exchanger tubes of boilers.

The Examiner states that JP '087 discloses a nickel based alloy which comprises N as one component. Contrary to the Examiners' statement, however, JP '087 itself does not teach incorporating N into their alloy. The inclusion of N is only mentioned in paragraph 3 in the background section with respect to Japanese publication No. 1-132732. Japanese publication No. 1-132732 indicates that a Ni-Cr based alloy taught therein includes N as an unavoidable impurity and that the content of the N must be limited to less than 0.04%. The subject alloy of Japanese publication No. 1-132732 does not contain Mn and Mg.

Accordingly, JP '087 does not disclose or suggest the joint incorporation of Mg, N, and Mn such that the crystal phase stability of the Ni fcc lattice is improved. Applicants respectfully request that the rejection be withdrawn.

Claims 4-8 stand rejected as obvious over JP 8-103867 (JP '867). JP '867 discloses a clad-type steel pipe which purportedly has an excellent high temperature corrosion resistance. The clad steel pipe comprises an inner material made of carbon steel, alloy steel, and stainless steel, and a clad layer formed by cladding by welding of a Ni-based alloy, which has a composition in the system of Ni-Cr-Mo, wherein C≤ 0.1%, Si≤ 3.0%, Mn≤ 3.0%, Cr: 15.0~35.0%, Mo: 1.0~20.0%, Cr+Mo: 20.0~50%, and small amount of W, Nb, Ta, Re, and N.

Initially, applicants note the differences of a clad steel pipe, in which the nickel based alloy is welded over a base steel pipe, and the presently claimed nickel alloy which has an intrinsic mechanical strength such that it can be used as a member for supercritical water environments containing inorganic acids. A person or ordinary skill would not look to a clad pipe in order to prepare a pipe for the supercritical water environments that the present alloy is suited.

Further, claims 4-8 call for the joint incorporation of Mg, N, and Mn such that the crystal phase stability of the Ni fcc lattice is improved. This element is not disclosed or suggested in JP 8-103867 (JP '867).

Claims 9, 11-12, 15 and 17 stand rejected as obvious over JP '087. As explained above, JP '087 does not disclose or suggest the joint incorporation of Mg, N, and Mn such that the crystal

phase stability of the Ni fcc lattice is improved. Applicants respectfully request that the rejection be withdrawn.

Claims 10, 13-14 and 16 stand rejected as obvious over JP '087 further in view of U.S. Patent No. 5,958,332 issued to Hoeg ("Hoeg"). The Examiner admits that JP '087 does not teach an alloy containing 1.0 to 6.0% Nb. The Examiner states that Hoeg teaches adding 1-2% Nb to harden the alloy. Neither reference, however, teaches the joint incorporation of Mg, N, and Mn such that the crystal phase stability of the Ni fcc lattice is improved. Applicants request the rejection be withdrawn.

Claims 18-19, 21, 23 and 26 stand rejected as obvious over JP '867. As set forth above, a person of ordinary skill in the art would not be motivated to consult JP '867 since it teaches a clad steel pipe which is not suitable for the supercritical water environments containing inorganic acids. Further, this reference does not teach or suggest the joint incorporation of Mg, N, and Mn such that the crystal phase stability of the Ni fcc lattice is improved.

Claims 20, 22 and 24-25 stand rejected as obvious over JP '867 further in view of U.S. Patent No. 6,761,854 issued to Smith. Smith discloses a Ni-based alloy with purportedly excellent durability against high temperature and corrosion resistance. The composition of the Ni-based alloy is 52~58% Ni, 21~28% Cr, 2~3.5% Al, 0.05~2% Ti, 0.005~0.1%Y (carburization), 0.01~0.6% Zr, (sulfidation), 0~0.01% B, 0~4% Fe, and 0~1% Hf. Neither reference teaches the joint incorporation of Mg, N, and Mn such that the crystal phase stability of the Ni fcc lattice is improved. Applicants request the rejection be withdrawn.

In view of the above, applicants submit that the above application is in condition for allowance.

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Respectfully submitted,

By _____
Jason C. Chumney
Registration No.: 54,781
DARBY & DARBY P.C.
P.O. Box 5257
New York, New York 10150-5257
(212) 527-7700
(212) 753-6237 (Fax)
Attorneys/Agents For Applicant